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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,948	01/22/2004	Jeffrey P. Allen	05046-00041	5979

22910 7590 10/11/2006

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EXAMINER
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CANTELMO, GREGG

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 10/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/762,948

Applicant(s)

ALLEN, JEFFREY P.

Examiner

Gregg Cantelmo

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 and 31-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,10-13 and 31-33 is/are rejected.
- 7) ☒ Claim(s) 2-9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                            |                                                                                         |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                           | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 18, 2006 has been entered.

### ***Response to Amendment***

2. in response to the amendment received August 18, 2006:
- a. Claims 1-13 and 31-33 are pending;
  - b. The prior art rejection of record stands.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
3. Claims 1, 12 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11-250917 A (JP '917) in view of U.S. Patent No. 4,233,833 (Balinski).

JP '917 discloses a method of manufacturing a segmented plate, comprising the following steps: providing a sheet of material having a fixed width; passing the sheet through a tool 14 a predetermined distance; forming a pattern on portion of the sheet (Figs. 8 and 9) with the tool along the length of the sheet, the pattern including ribs which are capable of being flow paths on opposite side of the sheet and outer portions being free of ribs; the sheet being continually drawn through the tool to form a plurality of sheets thereby repeating the steps of forming the pattern on the sheet and passing the sheet through the tool until the sheet possesses a desired quantity of segments. (Figs. 1a, 1b and 5-9 as applied to claim 1). The plate includes first and second outer portions free of ribs (see Figs. 6, 8 and 9).

With respect to the additional limitations of providing the plate in a fuel cell, the method claims are drawn to a process of making the sheet and thus it is held that the sheet is formed prior to disposing it within the fuel cell. Thus the method of making the sheet is distinct from the intended use of the sheet such as disposing the sheet in a fuel cell and any limitations defining such are not accorded patentable weight.

The ribs are formed perpendicular to the directional flow of the plate (Figs. 1a, 1b and 5-9 as applied to claim 12).

The continuous sheet is then cut to form the plates shown in Figs. 8 and 9 as applied to claim 31).

The sheet is coiled after stamping (Fig. 1b as applied to claim 32).

The differences between JP '917 and instant claim 1 are that JP '917 does not disclose forming sections with respect to the predetermined distance steps as recited in claim 1, or of providing apertures in the outer portions (claim 33).

JP '917 does teach of forming a plate having flat ends between which lies between undulating sections of ribs in the plate. JP '917 forms these ribs using what appears to be a continuous rolling array.

The use of dies or rollers to form corrugated plates is a well known technique in the art as shown by Balinski (Fig. 13 and col. 40-60). The process further provides mating apertures 11/12 in the planar outer portions of the plate (Fig. 3) for the purposes of maintaining the alignment of the plate as it passes through the tool.

Thus the use of either rollers or a die can be used to form corrugated plates having centrally disposed ribs between peripheral flat ends.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '917 by using either rollers or dies for forming corrugated plates having centrally disposed ribs between peripheral flat ends since they are known equivalent techniques for fabricating the same plate design. In using the die, the process inherently requires the predetermined distance steps as recited in claim 1 to continually form the ribs on the continuous substrate sheet as it is passed through the die.

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Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '917 to further include mating apertures in the planar outer portions of the plate since it would have maintained the alignment of the plate as it passes through the tool.

4. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '917 in view of Balinski, as applied to claim 1 above and further in view of U.S. patent No. 6,261,710 (Marianowski).

The teachings of claim 1 have been discussed above and are incorporated herein.

The difference between claims 10 and 11 and JP '917 are that JP '917 does not disclose of forming coolant flow paths within each segment (claim 10) by mating two sheets having patterns together, the ribs of one sheet having a height greater than the ribs of the other such that channels exist between the two sheets (claim 11).

Marianowski discloses providing a nested separator arrangement in a dual undulated sheet separator in Fig. 3. This arrangement provides both reactant flow and coolant flow to the separator.

The motivation for providing the arrangement of Marianowski is that it improves the temperature control of the separator and fuel cells adjacent the separator.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '917 by providing the nested separator arrangement as suggested by Marianowski since it would have

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improved the temperature control of the separator and fuel cells adjacent to the separator.

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '917 in view of Balinski, as applied to claim 1 above and further in view of U.S. patent No. 4,514,475 (Mientek).

The teachings of claim 1 have been discussed above and are incorporated herein.

The difference between claim 13 and JP '917 is that JP '917 does not disclose of folding the edges over onto itself to form a seal.

Mientek discloses folding the edges of a fuel cell separator (Figs. 2, 3, 5 and 6).

The motivation for folding the edges of the separator is that it provides a seal.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '917 by folding the edges of the separator over onto itself as suggested by Mientek since it would have provided a reactant seal.

6. Claims 1, 10-12 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marianowski in view of JP '917 and Balinski.

In the alternative, if weight is given to the fuel cell process steps of claim 1:

Marianowski discloses a nested fuel cell separator arrangement in a dual undulated sheet separator in Fig. 3. This arrangement provides both reactant flow and coolant flow to the separator (as applied to claims 1, 10 and 11).

Marianowski does not teach of the method of manufacturing the plate.

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The concept of providing corrugated features in a plate is a well known technique in the art of deforming metal plates as shown by JP '917 and Balinski, discussed above and incorporated herein (as applied to claims 1 and 31-33). In addition, both JP '917 and Balinski teach of providing outer portions which are planar (see Figs. 6, 8 and 9 of JP '917 and Figs. 3 and 5 of Balinski).

The motivation for using the process of JP '917 as Balinski is that it provides a high through-put process for manufacturing plural separator plates for mass production of the plates useful as fuel cell separators.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Marianowski by using the general plate manufacturing process of JP '917 and Balinski since it would have provided a high through-put process for manufacturing plural separator plates for mass production of the plates useful as fuel cell separators.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marianowski in view of JP '917 and Balinski, as applied to claim 1 above and further in view of U.S. patent No. 4,514,475 (Mientek).

The teachings of claim 1 have been discussed above and are incorporated herein.

The difference between claim 13 and Marianowski is that Marianowski does not disclose of folding the edges over onto itself to form a seal.

Mientek discloses folding the edges of a fuel cell separator (Figs. 2, 3, 5 and 6).

The motivation for folding the edges of the separator is that it provides a seal.



Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Marianowski by folding the edges of the separator over onto itself as suggested by Mientek since it would have provided a reactant seal.

***Response to Arguments***

8. Applicant's arguments with respect to claims 1-13 and 31-33 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues that:

"The combination of JP '917 and Balinski fails to disclose a method of manufacturing a segmented fuel cell bipolar separator plate including forming a pattern on a central portion of a sheet including ribs, with the central portion positioned between a first outer portion and a second opposed outer portion, the first and second outer portions being free of ribs and positioned at opposed ends of the ribs, as required by independent claim 1. The ribs of JP '917 extend fully to the end of the sheet, with no outer portions free of ribs formed at the end of the ribs. Balinski, on the other hand, shows outer portions free of ribs, but which are formed along the sides of the corrugations, not at their opposed ends."

However the Examiner respectfully disagrees.

As discussed above, the ribs of JP '917 extend fully to the only one set of opposing ends of the sheet. In fact, as shown in Figs 6, 8 and 9 of JP '917, the second set of opposing ends of the ribs clearly constituted outer portions which are free of ribs.

In addition, Figs. 3 and 5 of Balinski also disclose outer planar portions on opposed ends of the ribbed plate.

Therefore the prior art of record is still held to teach of outer planar portions surrounding the ribbed portion of the plate and since the prior art still teaches this arrangement, the combination of prior art in the aforementioned rejections still obviate the claimed invention and the rejections stand.

***Allowable Subject Matter***

9. Claims 2-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. As set forth in the previous office action, none of the prior art of record is held to reasonably teach or suggest the pattern further includes a mating pair of apertures in the first outer portion of each segment and a second mating pair of apertures in the opposed second outer portion of each segment. Balinski only provides one aperture in each of the outer portions and does not teach or reasonably suggest providing two apertures in each section as shown in Fig. 22, by example (with respect to claims 2-9).

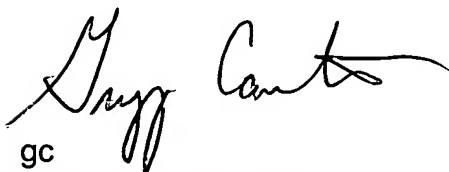
***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:00-5:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



gc

September 30, 2006

Gregg Cantelmo  
Primary Examiner  
Art Unit 1745